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A NEW SPECIES OF GREEN TREE FROG (ANURA: HYLIDAE) FROM QUEENSLAND, AUSTRALIA

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ABSTRACT: The nominal species of hylid frog *Litoria chloris* (Boulenger) is demonstrated to include two species. *Litoria chloris sensu stricto* occupies coastal localities in southeastern and south-central Queensland and northern New South Wales, and an allopatric population in northern coastal Queensland is here described as *L. xanthomera* sp. nov. It is distinguished by external morphology as well as by estimates of genetic distance derived from isoenzyme electrophoresis. Osteology, larval form and male call are described.

The known frog fauna of Australia has increased exponentially over the last decade (Tyler 1982). A major contributing factor has been access to the monsoonal wet-dry tropics of the north of the continent during the wet season when fossorial species are active. Concurrently, knowledge of the fauna of the north-eastern seaboard of Australia has improved, principally as a result of a comprehensive faunal survey program by the Queensland National Parks and Wildlife Service.

Davies and McDonald (1979) examined the morphology of three disjunct populations of the hylid frog *Litoria chloris* (Boulenger), and noted differences between the northern population and the other two populations (southern and central) in the eye and thigh colouration and head length to head width ratios. They did not assign specific status to the northern population in the absence of call and life history data.

A preliminary electrophoretic survey of a number of species of Australian hylids (Adams, unpublished) indicated that genetic differences existed between the northern and southern populations of *L. chloris*. This paper includes a comprehensive electrophoretic study of *L. chloris* and confirms the genetic uniqueness of the northern population. In the light of this information and with the availability of call and life history data we herein describe the northern population as a new species.

MATERIALS AND METHODS

ELECTROPHORESIS

A total of 21 specimens from four populations derived from the three geographic areas was available for electrophoresis. The northern form was represented by two samples. Sample D was collected in 1981 and the tissues obtained were found to be still suitable for electrophoretic analysis. The other three samples were collected in February, 1984. Reference material is deposited in the South Australian Museum, Adelaide (SAM): *Northern Population*, SAM R25736-40, Lannercost State Forest, K.R. McDonald and P. Minton (Sample C); *Central Population*, SAM R25761-66, Eungella, N.P., Qld, K.R. McDonald (Sample B); *Southern Population*, SAM R25758-60, Watagan S.F., N.S.W., M. Mahony (Sample A). Sample D (northern population) was from Caithu State Forest, Qld.

Liver from each specimen was homogenized in an equal volume of lysing solution (distilled water containing 10 mg NADP and 0.1 ml β mercaptoethanol per 100 ml). Homogenates were then centrifuged at 10,000 g for 10 minutes at 4°C and the supernatants stored at −20°C in separate 5μl aliquots.

Electrophoresis was conducted according to standard techniques as described in Baverstock, Watts, Adams and Gelder (1980). The proteins of an estimated 43 loci gave sufficient activity and resolution to be scored. The proteins stained, together with the abbreviations used and the appropriate Enzyme Commission number, are:

Aconitase (ACON: 4.2.1.3), Acid phosphatase (ACP: 3.1.3.2), Adenosine deaminase (ADA: 3.5.4.4), Adenyl kinase (AK: 2.7.4.3), Albumin, (ALB), Carbonic anhydrase (CA: 4.2.1.1), Diaphorase (DIA: 1.6.2.2), Enolase (ENOL: 4.2.1.11), Fumarase (FUM: 4.2.1.2), Glyceraldehyde-3-phosphate dehydrogenase (GA3PD: 1.2.1.12), Glutamate-oxaloacetate transaminase (GOT: 2.6.1.1), α Glycerophosphate dehydrogenase (α GPD: 1.1.1.8), Glucose-phosphate isomerase (GPI: 5.3.1.9), Glutathione reductase (GSR: 1.6.4.2), Guanylate kinase (GUK: 2.7.4.8), Glyoxalase I (GLO I: 4.4.1.5), Isocitrate dehydrogenase (IDH: 1.1.1.42), Lactate dehydrogenase (LDH(: 1.1.1.27), Malate dehydrogenase (MDH: 1.1.1.37), Malic enzyme (ME: 1.1.1.40), Mannose-phosphate isomerase (MPI: 5.3.1.8), Peptidases (PEP (A, B, C_1, C_2, D): 3.4.11 or 13), Phosphoglycerate mutase (6PGD: 2.7.5.3), 6 Phospho-gluconate dehydrogenase (6PGD: 1.1.1.44), Phosphoglycerate kinase (PGK: 2.7.2.3), Phosphoglucomutase (PGM: 2.7.5.1), Pyruvate kinase (PK: 2.7.1.40), Superoxide dismutase (SOD: 1.15.11), Sorbitol dehydrogenase (SORDH: 1.1.1.14), Triose-phosphate dehydrogenase (TPI: 5.3.1.1).

Genetic distances between populations were calculated as fixed differences or as Nei differences corrected for small sample sizes (Nei 1978).

MORPHOMETRIC ANALYSIS

The specimens reported here are deposited in institutions abbreviated in the text as follows: American

TABLE 1

ALLELE FREQUENCIES AT 43 LOCI IN THE FOUR POPULATIONS OF *Litoria chloris*. *Populations A-D as in Davies & McDonald (1979). Alleles are designated a, b, c, etc. in order of increasing electrophoretic mobility. Where there is more than one locus scorable per enzyme, loci are numbered in order of increasing electrophoretic mobility*

		Southern	Central	Northern	
		A	B	C	D
Acon-1	b	100	100	100	64
	a				36
Acon-2	c		83		
	b		17	100	100
	a	100			
Ada-2	c		58		
	b	100	42		
	a			100	100
Ak-1	b		42	60	36
	a	100	58	40	64
Ca	b	100	75	100	100
	a		25		
Dia-1	b	100	100		
	a			100	100
Enol	b	50	50	40	50
	a	50	50	60	50
Fum	b	100	100		
	a			100	100
Ga_3pd	b		100	60	100
	a	100		40	
Got-2	b	100	100	90	100
	a			10	
αGpd	b			100	100
	a	100	100		
Gpi	b	50	100	100	100
	a	50			
GloI	b	100	100	80	100
	a			20	
Ldh-2	b	83	100	100	100
	a	17			
Me-2	b	100	42	100	100
	a		58		
Mpi	b			100	100
	a	100	100		
Pep B	c		17		
	b		83		
	a	100		100	100
Pep C1	b	50	92		
	a	50	8	100	100
Pep C2	b	100	40		
	a		60	100	100
Pep D	e				50
	d		17		
	c		8		
	b	100	75	50	40
	a			50	10
6Pgd	c		25	100	100
	b	100	67		
	a		8		
Pgm-1	b		8		
	a	100	92	100	100
Pgm-2	c			100	100
	b	100	92		
	a		8		
Pk	b		40	80	100
	a	100	60	20	

TABLE 1 *continued*

		Southern A	Central B	Northern C	Northern D
Sod	b			100	100
	a	100	100		
Sordh	e				15
	d		8	60	64
	e	50		20	7
	b	50	92	10	7
	a			10	7
Tpi	b		100		50
	a	100		100	50

The following 16 loci were invariant: *Acp, Ada-1, Ak-2, Alb, Dia-2, Got-1, Gst, Guk, Idh-1, Idh-2, Ldh-1, Mdh-1, Me-1, Pep A, Pgam, Pgk.*

Museum of Natural History (AMNH); Australian Museum, Sydney (AM); British Museum (Natural History) (BMNH); Museum of Comparative Zoology, Harvard (MCZ); University of Kansas, Museum of Natural History (KU); Queensland Museum, Brisbane (QM); South Australian Museum, Adelaide (SAM); Western Australian Museum, Perth (WAM).

Methods of measurement follow Tyler (1968) and osteological descriptions follow Trueb (1979). Tadpoles were fixed in Tyler's (1962) fixative and staged according to Gosner (1960). Osteological specimens were cleared and stained for bone after Davis and Gore (1947) and for bone and cartilage after Dingerkus and Uhler (1977). Measurements were made using dial calipers or an eyepiece micrometer. Measurements of adults were: snout to vent length (S-V); tibia length (TL); head length (HL); head width (HW); eye to naris distance (E-N); internarial span (IN); eye diameter (E); tympanum diameter (T). The following ratios were calculated: TL/S-V; HL/HW; HL/S-V; E-N/IN. Where appropriate, means ± standard deviations followed by ranges are given.

Calls were recorded using a Uher 4000 tape recorder with Grampian DP4 or AKG D190 ES dynamic microphones. Dry bulb air temperatures were measured with a Shultheis quick reading thermometer close to the calling sites of males. Calls were analysed by means of a sound spectrograph (Kay Digital Sona-Graph-7800). Temporal characteristics of the calls were determined from wideband (300 Hz bandpass) and spectral characteristics from narrowband (45 Hz bandpass) spectrograms. Three examples of each call from each male were analysed and mean values calculated.

RESULTS

ELECTROPHORESIS

The results of the electrophoretic analysis are shown in Table 1 as putative allele frequences for each population at 43 presumed gene loci. Table 2 gives the genetic distance estimates between populations. The two populations of the northern form of *Litoria chloris* are genetically similar (0% fixed differences; Nei D of 0.017). In contrast, the northern form differs markedly from both the southern and central populations (average fixed difference, 23%; average Nei D, 0.379). There is some genetic differentiation between the central and southern populations (9% fixed difference; Nei D, 0.152).

MORPHOMETRIC ANALYSIS

Davies and McDonald (1979) analysed morphological variation between the three allopatric populations of *L. chloris* and showed that the head length to head width ratio of the northern population is statistically significantly different from that of the other two populations.

The northern population is distinctive in having orange thighs as opposed to blue thighs in the other two groups and in having an orange rim to the eye rather than a red rim as found in central and southern populations.

ADVERTISEMENT CALL

Audiospectrograms of calls of specimens from the northern and southern populations are shown in Fig. 1, and call parameters are listed in Table 3. It can be seen that there is overlap of pulse repetition rates between the

TABLE 2

GENETIC RELATIONSHIPS AMONG POPULATIONS OF *Litoria chloris*. Percentage fixed differences are shown below the diagonal with corrected Nei D's above.

		A	B	C	D
Southern	A	0	.152	.362	.409
Central	B	9	0	.369	.374
Northern	C	23	21	0	.017
Northern	D	28	20	0	0

TABLE 3
PHYSICAL CHARACTERISTICS OF CALLS OF MALES OF *Litoria xanthomera* AND *L. chloris*. Mean values are given with ranges in parentheses.
P.R.R. = pulse repetition rate.

Species, locality & date	Dry bulb temp. °C	Duration msec	No. of pulses	P.R.R. pulses/sec	Dom. Frequency Hz
L. xanthomera Henrietta Ck, Palmerston N.P. 13 Feb 1980 (Holotype)	21.8°C	76.67 (63-84)	162.33 (152-174)	217 (181-276)	2900
L. xanthomera type locality, 13 Feb 1980	21.8°C	61.67 (60-63)	158.67 (148-165)	257 (247-266)	3000
L. xanthomera Crater N.P. 13 Feb 1977	21.8°C	97.17 (93-99.5)	183.67 (174-192)	189 (187-193)	2900 3100
L. chloris Sunday Ck 23 Oct 1976	19.7°C	60.33 (60-61)	124 (119-128)	205 (198-210)	2600
L. chloris Kilcoy Ck 17 Oct 1978	17.2°C	83 (82-84)	120.33 (118-123)	145 (144-146)	2500

two groups and this rate would be expected to be more similar at comparable temperatures. Differences are apparent in pulse number and dominant frequeney.

DISCUSSION

The present study has demonstrated extensive genetie divergence between the northern and southern forms (populations A and B) of *L. chloris* but has not demonstrated signifieant divergence in the male eall characteristic of the two populations. Divergenee in colour and in head shape has been noted previously (Davies & MeDonald 1979).

The level of genetic divergenee eneountered far exeeeds that typically found between populations of the same speeies (Avise 1974; Ayala 1975; Baverstoek *et al.* 1977, 1980, 1982, 1983; Case 1978; Avise & Aquadro 1982; Adams unpublished). The degree of similarity between the southern and central populations, on the other hand, is eonsistent with that typieal of allopatrie populations of a single species.

It is not known how long the populations of *L. chloris* have been isolated, but clearly substantial diver-gence has occurred. The laek of signifieant divergenee in call strueture raises doubt as to the recognition of the northern form as a separate speeies. However, the genetie data are eonsistent with there being two species within *L. chloris* as eurrently recognised. Coupled with the morphologieal and phenotypic differenees reeorded, these considerations lead us to recognise the northern form of *L. chloris* as a separate speeies.

Litoria xanthomera sp. nov.
Figs. 1-9

Hyla chloris: Moore 1961, p 263 (*part.*)
Litoria chloris: Davies & MeDonald 1979, p 353 (*part.*)

HOLOTYPE: QM J42011, an adult male from Henrietta Creek, Palmerston National Park, Qld, Australia (17°37', 145°40') eollceted on 13 Feb. 1980 by K.R. McDonald.

PARATYPES: SAM R24529-39, WAM R82619-20, KU 193847-48, BMNH 1983. 910-911, AM R106905-6, AMNH 117640-41, MCZ 106117-18 collected with the holotype; QM J17109, Atherton, Qld (17°16', 145°29') I.R. Straughan. 22 Feb. 1961; QM J17110, Crystal Cascades, via Cairns (145°40', 16°58') 15 Jan. 1965; QM J27105-6, Little Forks, S of Shiptons Flat, Qld (145°14', 15°48'30") G.J. Ingram, 16-21 Nov. 1975; QM J25194-5, Home Rule Falls, Cooktown (15°28', 145°15') J. Covaeevich and T. Tebble, 28 Oct. 1974; QM J25258-60, Home Rule Falls, 30 km S Cooktown (15°28', 145°15') J. Covacevieh and T. Tebble, 28 Oet. 1974; QM J25278, 0.4 km E of the Granites, Homc Rule, 30 km S of Cooktown (15°28', 145°15'), J. Covacevieh and K.R. MeDonald, 16 Nov. 1974; QM J38900, 33910, Crater N.P., (17°26', 145°29'30"), K.R. McDonald and R.G. Atherton, 13 Feb. 1977; QM J35901-3, 35950, 36011, NPWS Base, Palmerston N.P. (17°36', 145°46') K.R. MeDonald and R.G. Atherton, 11 Feb. 1977; QM J35916, 35985, Mt Lewis State Forest (16°35', 145°16') K.R. MeDonald and R.G. Atherton, 15 Feb. 1977; QM J35919, 35986, MeDowell Ra. (16°06', 145°20'), R.G. Atherton and J.W. Winter, 21 Oet. 1976; QM J35921, 39963, 36024 Lake Barrine N.P., (17°15', 145°38'), J. Winter, 5 March, 1973; QM J35943, 35960, Severin Boar Poeket, Atherton Tablelands (17°11'S, 145°40'E), J. Winter, 21 Oct. 1975; QM J35944, 35946, Mt Baldy, 7 km SW Atherton (17°19', 145°25') J. Winter and R. Atherton, 28 Nov. 1976; QM J35962, 36020, Longlands Gap, J. Winter, 1 Feb. 1973; SAM R16794-8 Gadgarra, S.F. (145°40',

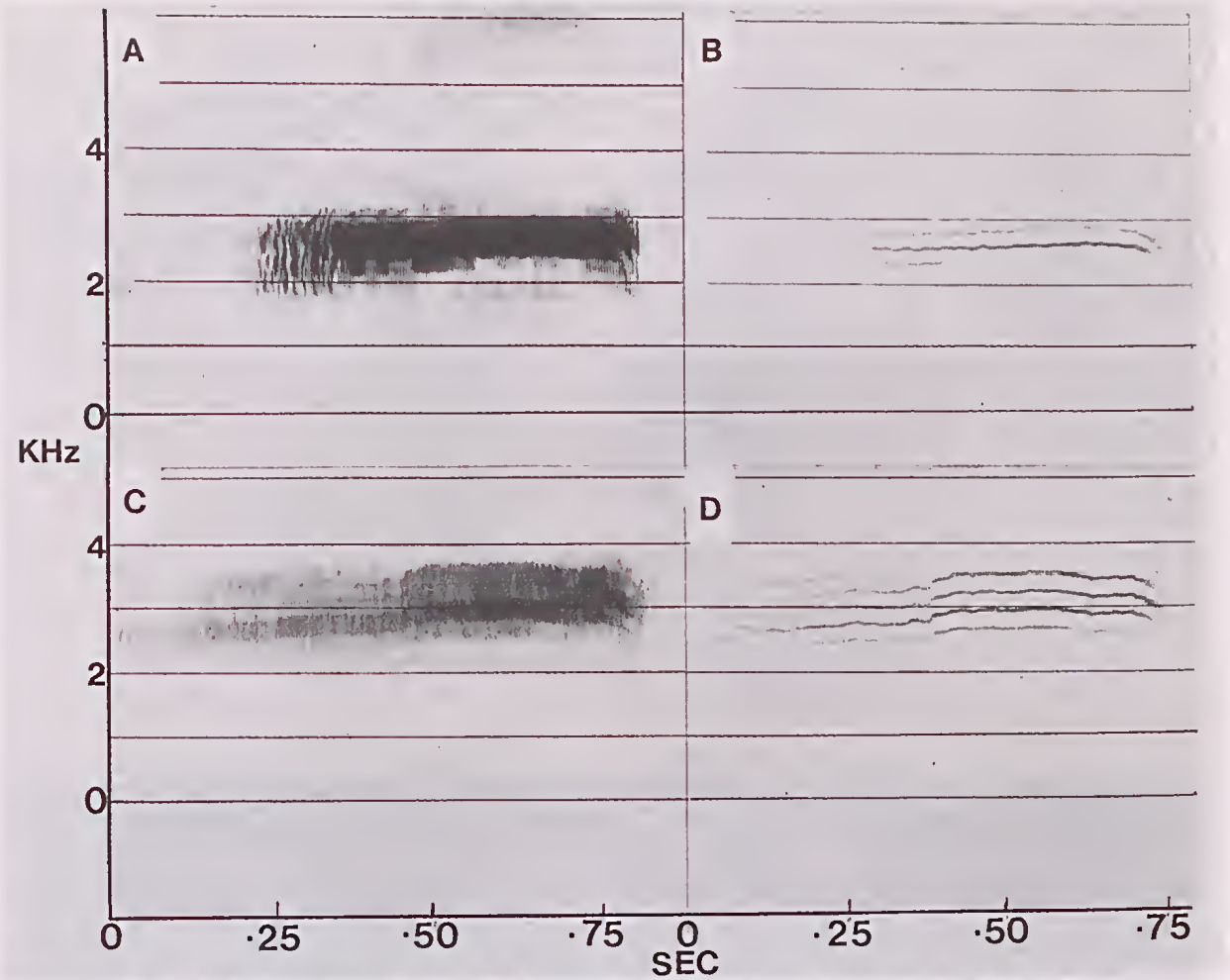

Fig. 1—Audiospectrograms of calls. A, B, *Litoria chloris* (Sunday Creek, Conondale Ra., Qld), A, 300 Hz bandpass, B, 45 Hz bandpass; dry bulb 17.2°C. C, D, *Litoria xanthomera* (holotype), C, 300 Hz bandpass, D, 45 Hz bandpass; dry bulb 21.8°C.

17°16'a30") K.R. McDonald and R.G. Atherton, 14 Feb. 1977; SAM R24524-5 (Cleared and stained) Gadgarra S.F. (145°40', 17°16'30"), K.R. McDonald and R.G. Atherton, 14 Feb. 1977; SAM R24526, Milaa Milaa Falls, 2 km from Milaa Milaa (145°37', 17°30') K.R. McDonald and R.G. Zweifel, 16 Jan. 1981; SAM R24528 Kuranda S.F., 2.6 km along Blaek Mt Road from Kuranda, (145°38'30", 16°48') 24 Oet. 1981. K.R. McDonald, R.G. Zweifel and W. Hosmer; SAM R24529, nr Peeramon, (145°27'30", 17°19'), K.R. McDonald and R.G. Zweifel, 18 Jan. 1981. SAM R25736-40, Lannereost S.F., nr Wallamin Falls, K.R. McDonald and P. Minton, 16 Feb. 1984.

DIAGNOSIS: A moderately large green speeies (females 43-55 mm, males 40-56 mm) with widely expanded finger and toe dises, well developed finger and toe webbing, orange rimmed eyes, brilliant orange thigh markings and a rounded eanthus rostralis.

DESCRIPTION: Head flattened, slightly broader than long (HL/HW 0.99); head length about two-thirds of snout to vent length (HL/S-V 0.32). Snout not prominent, truneate when viewed from above (Fig. 2), abrupt, very slightly rounded in profile (Figs. 3, 4). Nostrils lateral, distanee from end of snout about 25% that from eye. Eye to naris distanee less than internarial span (E-N/IN 0.85). Canthus rostralis well defined and slightly eurved. Eye large, extremely prominent (Fig. 4), diameter greater than eye to naris distanee. Tympanum distinet, eovered with skin, diameter less than eye diameter, separated from eye by distanee about 50% own diameter. Vomerine teeth in two small series, elose together, angled at about 45° to midline between and below choanae. Tongue moderately large, triangular.

Fingers short with lateral fringes. Order of length 3 > 4 > 2 > 1 (Fig. 5A). Webbing between 3 and 4 reaches subartieular tubereles at base of penultimate phalanx on 4. Terminal dises prominent with well developed eireummarginal grooves. Hind limbs moderately long and slender (TL/S-V 0.54). Toes in order of length 4 > 5 > 3 > 2 > 1. Webbing between 1 and 2

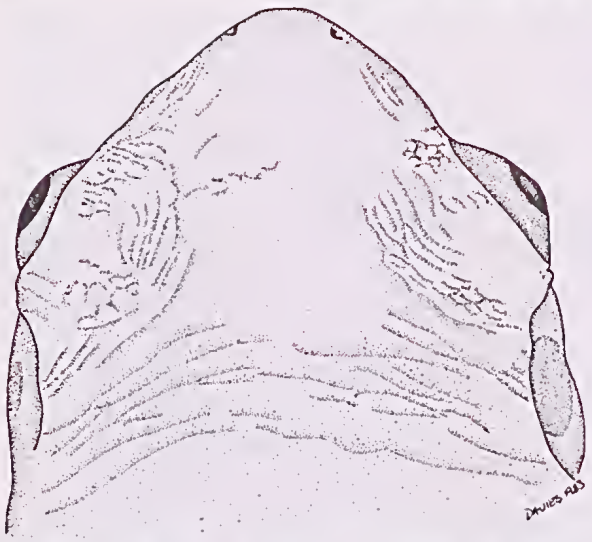

Fig. 2—Dorsal view of head of holotype of *Litoria xanthomera*. QM J42011.

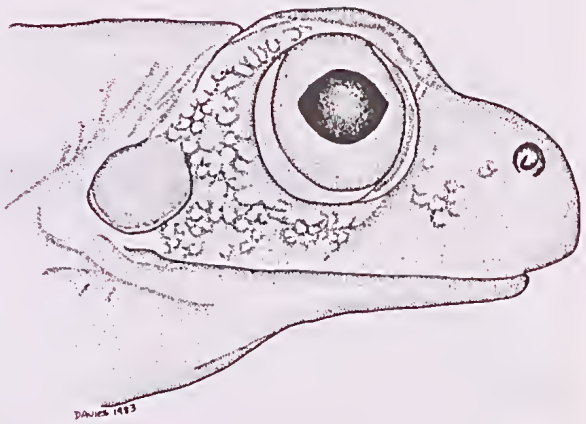

Fig. 3—Lateral view of head of holotype of *Litoria xanthomera*. QM J42011.

Fig. 4—*Litoria xanthomera* in life. Specimen from Palmerston National Park, Qld.

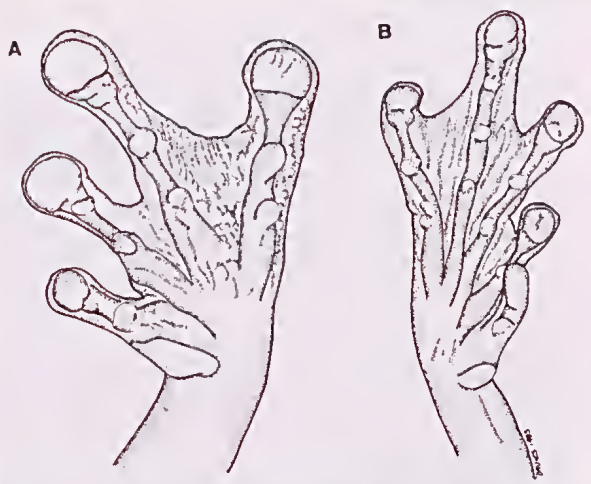

Fig. 5—A, Palmar view of hand and B, plantar view of foot of holotype of *Litoria xanthomera*. QM J42011.

from disc to subarticular tubercle on penultimate phalanx of 2, the same between 2 and 3, and 3 and 4, and from subarticular tubercle on penultimate phalanx of 4 to disc of 5 (Fig. 5B). Small oval inner and no outer metatarsal tubercle.

Dorsal and lateral surfaces of head and body finely granular. Inconspicuous dermal fold at wrist. Prominent slightly curved supratympanic fold from eye to level of forearm insertion. Throat and chest smooth, abdomen and thighs granular.

No nuptial pad developed. Submandibular vocal sac.

COLOURATION: *In preservative* — Dorsum, side of head and body, forearm, dorsal surface of tibia and medial dorsal stripe on tarsus, blue. Ventral surface, fingers, toes, upper portion of arm and thighs pale cream. Ventral surface cream. *In life* — Brilliant lime green on dorsum, lateral head and body, forearm, dorsal surface of tibia and medial dorsal stripe on tarsus. Dorsal surface of forearm yellow. Throat, ventrolateral surface of body yellowish/orange, thighs brilliant orange, ventral surface yellow. Eye rim bright orange.

MEASUREMENTS OF HOLOTYPE IN MM: S-V 44.1; TL 24.0; HL 14.3; HW 14.5; E-N 3.4; IN 4.0; E 4.9; T 3.2

VARIATION: Adult males measure 40.3-55.7 mm S-V and females measure 43.1-55.9 mm (47.74 ± 3.83, 40.3-55.9). Hind limbs moderately long (TL/S-V 0.54 ± .02, 0.50-0.58). Head length longer than head width (HL/HW 1.04 ± 0.44, 0.93-1.11). Head length about 33% snout to vent length (HL/S-V 0.33 ± .02, 0.29-0.35). Eye to naris distance to internarial span ratios highly variable (E-N/IN 0.98 ± 0.14, 0.77-1.27).

There is little or no variation in finger and toe webbing. In one specimen the tympanum is indistinct. Variability in colouration includes commonly a thin green stripe along the upper surface of the thigh (Fig. 4). In many specimens green colouration extends along the lateral edges of toe 5 and finger 4 and in some specimens along the lateral edge of toe 4 as well. Green colouration of the dorsal surface of the discs of toe 5 and finger 4 is detectable in some specimens.

Three of the paratypes have bulges beneath the dorsal skin behind the tympanum. These are attributed to the presence of larvae of dipteran (batrachomyid) parasites.

OSTEOLOGY: Skull moderately robust with moderately well ossified neurocranium (Fig. 6). Sphenethmoid well ossified extending between but not anteriorly to nasals dorsally and between vomers ventrally; overlapped dorsolaterally by nasals. Prootic completely fused with exoccipital; exoccipitals confluent. Crista parotica well developed, short, stocky, not articulating laterally with moderately expanded otic ramus of squamosals. Frontoparietal fontanelle moderately extensive, overlapped posterolaterally by moderately slender frontoparietals

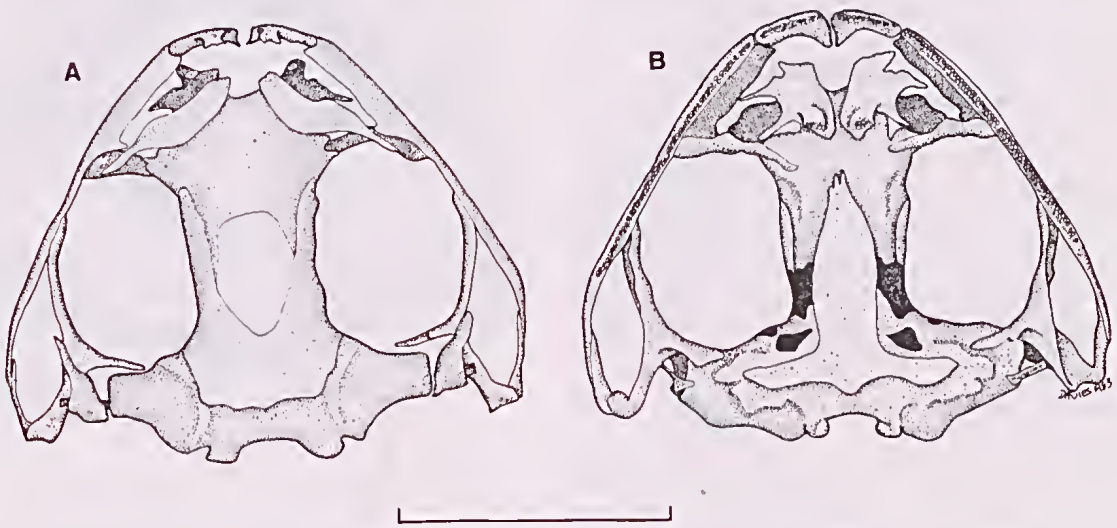

Fig. 6—A, Dorsal and B, ventral view of skull of *Litoria xanthomera*. SAM R24524. Scale bar = 10 mm.

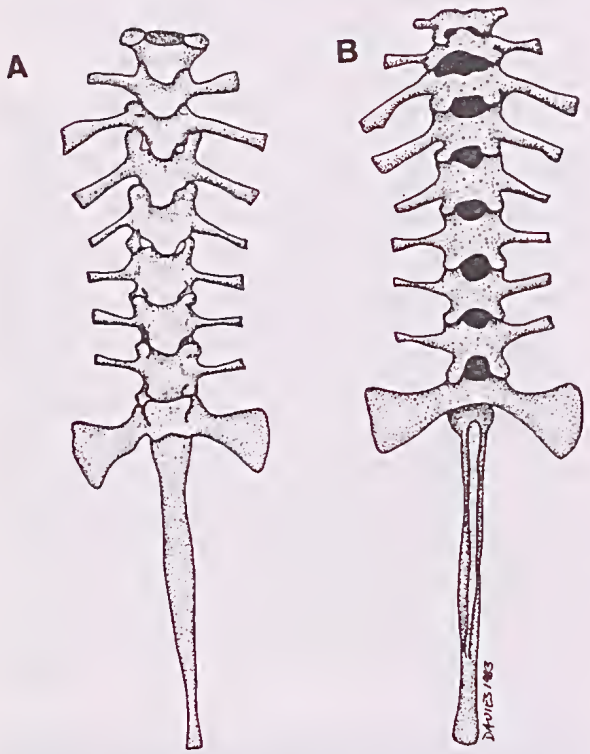

Fig. 7—A, Dorsal and B, ventral view of vertebral column of *Litoria xanthomera*. SAM R24524.

which extend about 67% of length of orbit. Anterior margin of frontoparietal fontanelle formed by sphenethmoid at level slightly less than anterior third of length of orbit. Posterior margin at level of anterior extremities of epiotic eminences. Nasals slender, moderately separated medially with slender acuminate maxillary processes not articulating with well developed preorbital processes of deep pars facialis of maxillaries (Fig. 6A). Palatines moderately long, ridged posteriorly (Fig. 6B), slightly tapering medially to terminate on sphenethmoid at level of lateral extremities of vomerine teeth. Parasphenoid robust with broad cultriform process, acuminate anteriorly, with short slender alary processes at right angles to cultriform process, not overlapped laterally by medial arms of pterygoid.

Pterygoid robust, anterior arm in short contact with palatal shelf of maxillary at level about ⅔ anteriorly on length of orbit; medial arm moderately long. Quadratojugal entire and in long contact with maxillary. Squamosals robust with short zygomatic rami. Maxillary and premaxillary dentate. Alary processes of premaxillaries broad, inclined slightly posteriorly. Palatine processes of premaxillaries well developed, not quite articulating medially. Vomers entire; alae form anterior and medial margins of choanae (Fig. 6B). Dentigerous provesses short, bearing seven teeth, angled slightly to midline. Bony columella present. Hyoid plate very short, width about double length; alary processes absent; posterolateral processes long and tapering.

Pectoral girdle arciferal and robust. Omosternum and xiphisternum present; clavicles slender, curved, moderately separated medially; coracoids robust, widely separated medially. Bicapitate scapula slightly longer than clavicles. Suprascapula about ⅓ ossified. Humerus with poorly developed dorsal crest. Eight procoelous nonimbricate presacral vertebrae. Relative widths of transverse processes III > IV > V > VI > II = VII ≈ VIII (Fig.7). Sacral diapophyses moderately expanded, ilia extend half way along their length. Urostyle bicondylar with dorsal crest extending about ⅔ its length. Pubis ossified; poorly developed dorsal prominence on ilium, rounded dorsal protuberance more superior than lateral.

Phalangeal formula of hand 2, 2, 3, 3. Terminal phalanges clawed. Well developed bony prepollex. Phalangeal formula of foot 2, 2, 3, 4, 3; small ossified prehallux. Intercalary structures cartilaginous.

LARVAE: The mouth disc (Fig. 8) has a formula of $\frac{1\ 1\ 1}{1\ 2\ 1}$ (see Martin 1965) and a well developed horny beak. The papillary border is well developed and extends around the sides and back of the mouth disc. A larva at stage 40 is shown in Fig. 9. Larvae are poorly pigmented, and tail fins are shallow. The spiracle is sinistral and below the midline, and the anus opens dextrally. Larvae are indistinguishable from those of *Litoria chloris* (see Watson & Martin 1979).

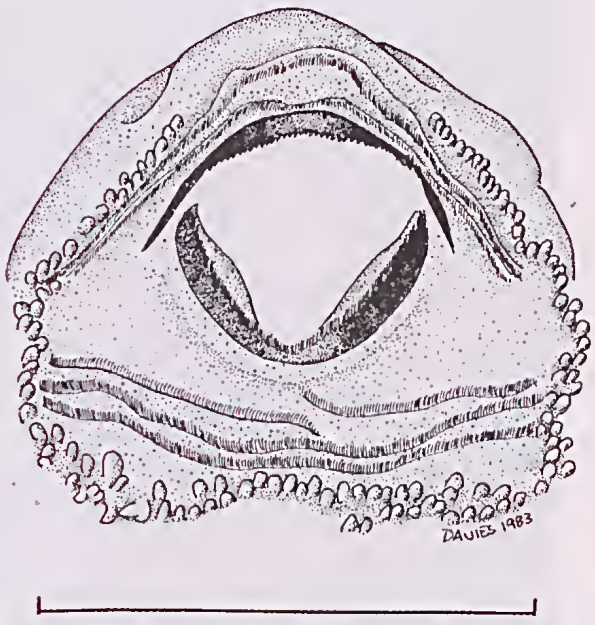

Fig. 8—Mouth disc of stage 40 larva of *Litoria xanthomera*. Scale bar = 2 mm.

Fig. 9—Lateral view of larva, Stage 40, of *Litoria xanthomera*. Scale bar = 10 mm.

CALL: Audiospectrograms of male calls of *L. xanthomera* and *L. chloris* are shown in Fig. 1 and call parameters are listed in Table 3. The call is a long growl at a dominant frequency of about 3000 Hz.

ETYMOLOGY: The specific name is derived from *xanthos* (Gk), "orange" and *meros*, "thigh" in reference to the colour of the thighs of this species.

DISTRIBUTION: Davies and McDonald (1979) mapped the distribution of this species as the northern population of *L. chloris*. The frog is confined to coastal rainforest from Home Rule to Mt Halifax in Queensland (McDonald unpubl.).

COMPARISON WITH OTHER SPECIES: *Litoria xanthomera* differs from all Australian congeners other than *L. gracilenta* and *L. chloris* in its size and brilliant green colouration. *Litoria gracilenta* is a smaller frog (males 31-42 mm and females 32-45 mm), with mauve thighs and a clearly defined, straight canthus rostralis. *Litoria xanthomera* is most closely related to *L. chloris* from which it differs in its brilliant orange thighs (blue in *L. chloris*), orange rimmed eye (red in *L. chloris*), head length to head with ratios (Davies & McDonald, 1979) and liver enzymes.

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